SCIENCE & GOVERNMENT REPORT

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Top Grad Schools Not Hurting, Study Says

In the graduate departments that regularly make the top twenty list, a standard lamentation in recent years has been that federal spread-the-wealth policies and open-opportunity directives are proving ruinous to academic quality. But now, a longtime student of the subject has come forth with a bit of myth-busting that says it isn't so, and since his observations have gone generally unnoted, they are worth reporting in some detail.

The departure from the common view is the work of David W. Breneman, an economist, who, since its inception in 1972, has been staff director of the National Board on Graduate Education, which is a creation of a consortium of some of the high temples of American scholarship, namely, the American Council on Education, the Social Science Research Council, the American Council of Learned Societies, and the National Research Council.

In a paper prepared for a Conference on Graduate Education: Manpower and Costs, July 10-12 at the University of Illinois, Urbana-Champaign, Breneman reported that on the basis of various data plus site visits to 14 universities, (listed bottom page three) he concluded that:

"In spite of the severe changes in the environment of graduate education during the last five years, most departments have been able to adjust

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Nuclear Safeguards Funds Cut

While President Nixon has been busy spreading nuclear reactors around sensitive parts of the world, the Administration has drastically cut back on funding for research aimed at strengthening international safeguards against the diversion of nuclear materials from power plants.

The Arms Control and Disarmament Agency (ACDA), which is responsible for conducting research and development on equipment and techniques to prevent the proliferation of nuclear weapons, has had its safeguards budget slashed from some $736,000 in 1973 to $200,000 in FY 1975. Rep. Les Aspin (D–Wisc.), who denounced the cutback in a public statement last month, suggested that it "is just one more example of how wrongheaded this Administration can be."

ACDA sources agreed last week that the agency's budget for supporting the nuclear Non-Proliferation Treaty is much too low, but they pointed out that the Senate Appropriations Committee is now considering a proposal to boost the expenditure to $474,000 by reallocating money from other ACDA programs.

The cutback in safeguards research was made as part of the across-the-board slash in ACDA's budget, and is probably merely a symptom of the agency's fall from grace in the Nixon Administration.

In Brief

NSF's increasing involvement with industrial firms is reflected in a recently released compilation of projects awarded by its Office of Energy R & D Policy. Industrial concerns are handling 12 of them, for a total of $1.2 million, compared with eight at academic institutions, for $439,000.

The Federal Advisory Committee Act, requiring the President to justify the existence of such groups or terminate them, resulted in the abolition of 390 of the 1,439 committees that existed at the end of 1973, according to a report to Congress. However, another 216 were created during the year, while 15 were listed as scratched for one reason or another.

Robert C. Seamans Jr., President of the National Academy of Engineering, is emerging as the leading candidate to head the Energy Research and Development Administration (ERDA), if and when the Congress eventually passes legislation to establish that agency. Seamans is said to have the support of, among others, NSF Director Guyford Stever and Philip Handler, President of the National Academy of Sciences.

The entreprenenial publishing ventures of John Maddox, former editor of Nature, *have been hit hard by inflation and the three-day work week which was imposed in Britain early this year. His newly founded magazine,* Environment and Change, *has foundered and Maddox is now engaged in freelance writing and broadcasting.*

Cries of Calamity Still Coming from Academe

While the Breneman assessment holds that reports of the demise of graduate education are greatly exaggerated (see article page one), vague warnings of impending calamity continue to emanate from the nation's campuses.

Typical of the genre is a recent Stanford University press release which commences with, "Biological research throughout the nation is in jeopardy because of recent trends in federal government policy toward funding crash programs of research aimed at finding cures for such things as cancer and heart disease, says the chairman of Stanford University's Biological Sciences Department."

" 'If a reversal in this policy is not obtained,' " the release quotes Professor Norman K. Wessells as telling the university Board of Trustees, " 'then I anticipate that departments of biology all over the country – even good ones – are going to have severe difficulty in obtaining funds to study neurobiology, ecology, or less glamorous and less disease-oriented areas of biology.' "

The release goes on to report Wessells telling the trustees that undergraduate classes are inundated with students interested in medicine and ecology, while graduate enrollments have been reduced by a decline in federal support.

From the point of view of persuading Washington policymakers that corrective measures are needed, such alarms turn out to be near worthless. The reason is that, on the basis of testimony from leaders of the scientific community, Congress went along with the argument that cancer and heart disease merit a high priority – and that crash programs in their behalf represent a sound investment of the available resources in terms of improving the nation's health. Furthermore, it should be recalled that lawyers predominate in Congress, and legal education is almost invariably at the expense of the student. Yet to be explained to the Congress is why aspiring Ph.D.'s in the sciences should be prepared for well-paying careers at the taxpayers' expense.

Finally, among those persons in Washington who concern themselves with scientific affairs, there is now a long acquaintanceship with predictions of catastrophes that never materalize.

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in ways that allow them to continue doing what they want to do; in short, the pressures that might force departments to change in directions counter to their preferences have not been sufficiently strong to compel change."

Breneman added that he believed this will continue to be the case for the leading departments for at least four or five more years, but that "In the immediate future, serious stress will be felt in the newly emerging doctoral programs and in older but weaker departments." It is "noteworthy," he continued, "that the above analysis goes counter to the emerging conventional wisdom that the best departments have experienced the most severe dislocations in recent years and have borne the bulk of the downward readjustment in enrollments and student support, while the newer programs of lower quality are thriving at their expense . . . "

From an examination of data on enrollments in chemistry, economics, psychology, electrical engineering, mathematics, and physics, he concluded: "Total full-time enrollments have declined in five of these six disciplines over the last six years (psychology being the exception), but there is no evidence of a major shift in the distribution of enrollments from higher to lower quality departments among the universities covered by these data."

Reviewing data supplied by NSF on traditional sources of student support for 14 major disciplines, Breneman reported an overall decline, but noted that "The top rated departments generally held their own or slightly increased the proportion of students supported by these basic forms of student support."

Breneman reports that chemistry has experienced a steady decline in full-time graduate enrollments for several years, but that student perceptions of the job market, rather than money for student support, appears to be the cause. "Enrollments do not appear to be limited by lack of financial support, for most departments have been able to offset the loss of fellowships with research and teaching assistantships (undergraduate chemistry enrollments are up dramatically over a few years ago.) . . . The competition for students reminds one of the football draft; many departments pay the travel and other expenses of potential students who wish to visit the university before deciding where to enroll. Needless to say,

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Drug Bioequivalency Study Satisfies All Factions

The Congressional Office of Technology Assessment (OTA) probably couldn't have chosen a more controversial topic for its first study than an assessment of whether or not supposedly identical drugs produce the same therapeutic effects when they are made by different processes. But its carefully worded report on the matter, published last month, has won the approval of everybody concerned and is being quoted by warring parties as supporting opposing positions.

The bioequivalence of drugs became a disputed topic last December, when HEW Secretary Caspar Weinberger passed word that the government would buy the cheapest drugs available on the market instead of opting for expensive brand-name products, provided that there are no "demonstrated differences in uniform quality and therapeutic equivalence."

Since Weinberger reckoned that such a policy would save $28 million in Medicaid alone – a figure which would be creamed off the profits of the drug industry – pharmaceutical manufacturers reacted with a barrage of complaints, chief of which was that since therapeutic equivalence can't be guaranteed, therefore by paying the lowest prices the government may be getting inferior products.

On that basis, the Pharmaceutical Manufacturers Association (PMA), the association which represents the largest US drug makers, argued that OTA's "superb" report completely undercuts Weinberger's "ill-advised proposal," while HEW says that the study provides grounds for pushing ahead cautiously with its policies.

The reason why OTA's conclusions seem to mean different things to different people is simple enough. The report concludes that because of insufficient quality control standards, therapeutic equivalence cannot be guaranteed, but that for many drugs it doesn't matter since there is such a wide difference between the dose needed to produce a therapeutic effect and the toxic dose.

Thus, the OTA report comes up with a slew of recommendations for tightening federal standards for drug manufacture, including better tests for therapeutic equivalence, and suggests that FDA should be given authority to demand more detailed information from drug companies on their manufacturing processes. The committee's chief

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virtually every full-time chemistry student in graduate school today receives full financial support for his degree.

"Unless there is an abrupt drop in extramural research funding, there is no reason to believe that the strong, established departments will fail to hold their own, either in the number or the quality of the students they attract."

Economics, Breneman observed, has never been heavily dependent upon federal support, and "Since most departments had not adopted the pattern of offering all students full financial support, the reduction in support did not cause many departments to voluntarily reduce enrollments . . . My over-riding impression from the 14 departmental visits was one of great stability and little excitement or worry. Complacency is probably the best overall description."

The decline in enrollments in electrical engineering, Breneman concluded, reflects the job market rather than availability of student support. "Several departments that we visited had money chasing students, and the continuing high percentage of foreign students enrolled is partial testimony to the recruitment difficulties facing many departments. (I say this," he added, "because several departments were clearly worried by the steady increase in their percentage of foreign students, and mentioned that word had come down from the administration that the numbers should be reduced.")

So, here again, despite the prophecies of doom that are commonplace (see box page 2), it turns out that the long-heralded catastrophe has not occurred. The principal casualty appears to be the credibility of some academic leaders, and the shame of it all is that when real problems do occur, and help is needed, they will find it difficult to obtain an audience. – DSG

(Copies of Breneman's paper, "Implementing Proposed Changes in Graduate Education," may be obtained from the National Board on Graduate Education, National Academy of Sciences, 2101 Constitution Ave. N.W., Washington, D.C. 20418.)

The universities visited were: Catholic University; University of Pittsburgh; University of Tennessee, Knoxville; University of Cincinnati; University of Wisconsin, Madison; Kansas State University; Tufts University; Tulane University; University of Arizona; Stanford University; University of California, Berkeley; SUNY-Buffalo; Cornell University; and University of Northern Colorado.

Next OTA Studies Will Be a Long Time Coming

OTA has no intention of following the recently published bioequivalency study with a rash of other quick-fire reports for, although three more studies were launched last month, it will be at least a year before any of them comes to fruition.

The three studies involve food supplies, an assessment of policies for developing rapid rail transit systems, and a study of systems for generating electricity from solar energy. In addition, the OTA Board agreed last week to press ahead with a study of ocean resources and marine technology, which will concentrate primarily on development of resources off the New Jersey-Delaware coast.

Each of the studies will be conducted by outside contractors, guided by a panel of independent experts, and with staff supervision provided by OTA.

The food supply study at present consists of a panel chaired by Clifton R. Wharton, president of Michigan State University, whose first task will be to find a method for drawing together information affecting food supplies in a manner which will be useful for legislators.

As for the rapid transit study, OTA has now let two contracts, worth a total of $450,000 to Battelle-Columbus Laboratories and to Skidmore, Owings and Merrill, to study, among other things, ways of reducing cost overruns for transit systems, and how communities decide whether to develop or modernize mass transit. The studies, which will be completed in a year, are being guided by an 11-member advisory panel chaired by George Krambles, an official of the Chicago Transit Authority.

The solar-electric assessment, which is being carried out by the Midwest Research Institute under a $311,000 contract, will be concerned with the potential for medium-to-large scale solar powered generating units. It will take 14 months to complete.

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contention is that present federal controls are too lax to assure uniform quality in the drug supply.

PMA therefore suggests that the government should make sure that it can guarantee therapeutic equivalency between different brands of the same drug before introducing its pricing policies. But HEW officials, testifying last month before the Senate Health subcommittee, announced that they will soon apply the policy to some 20 or 30 of the 200 best-selling drugs for which bioequivalence is not critical. At the same time, as federal quality control standards are tightened so that bioequivalence can be demonstrated for more drug products, and as patents expire on more of the top-selling drugs, the purchasing policy will be extended.

In the meantime, Senator Kennedy has announced that his health subcommittee will amend S 3441, the Drug Utilization Improvement Act (SGR Vol. IV, No. 10), to incorporate many of OTA's suggestions for tightening federal control of drug manufacturing.

The OTA report was prepared by a panel of independent experts headed by Dr. Robert W. Berliner, newly appointed Dean of Yale Medical School and former NIH Director for Science. The report, *Drug Bioequivalence,* is available from the Office of Technology Assessment, US Congress, Washington, DC 20510.

ACS Creates Legal Aid Fund

Any chemist or chemical engineer who is considering a lawsuit against his employer over such matters as denial of tenure or vindictive firing for blowing the whistle on corporate malpractice has a potential new source of legal expenses. The American Chemical Society has initiated a loan fund which will generally lend up to $2,000 for such legal action, and the Society says that it will consider lending up to $10,000 in special cases.

The brainchild of ACS past-President Alan Nixon, the scheme is open to anybody who can fulfill the educational and professional requirements for ACS membership, although non-ACS members will have to pay a $50 service charge.

The ACS now gets about 25 complaints a year from members claiming that they have been victimized or otherwise professionally mistreated by their employers. Most of the cases are resolved before the litigation stage, but those that aren't will now be eligible for the legal aid program.

Two cases, both involving ACS members are, in fact, now being considered for legal aid. The first involves a woman who has been denied tenure at an academic institution alledgedly because of sex discrimination, and the second involves a man fired from his job after he wrote a book criticizing big business.

Congress Seeks Speed on Solar Projects

Congressional leaders in the energy field have come to the conclusion that, despite a gusher of claims and statements of good intent, the Nixon Administration lacks a coordinated and adequately funded program to bring solar energy to the stage of commercial feasibility, and they are pushing ahead with legislation to get such a program under way.

Congressional action is centerd on two bills, one of which (S 3234) is likely to be reported soon by the Senate Interior Committee, while the other (HR 15612) is under active consideration in the House Committee on Science and Astronautics. The prospects for both are, however, clouded by possible jurisdictional battles and by the politics of impeachment, but there nevertheless remains a slim chance that some form of legislation will clear Congress before the end of the year.

In any case, since the Senate bill is sponsored by Senators Hubert Humphrey (D-Minn), Henry M. Jackson (D-Wash) and a group of other influential members, while the House measure enjoys the support of key members of the House Committee on Science and Astronautics, including chief energy guru Mike McCormack (D-Wash), there's good reason to expect that it will be resurrected next year.

Although the two bills differ in detail, they are in accord in their intent. The key provision in each is the establishment of an independent office within the federal government to manage and coordinate a massive research, development and demonstration program on solar energy, a measure which reflects the feeling that the Administration's present efforts are limited to undirected research efforts.

Another common provision would establish a special national solar energy laboratory, which would enjoy the same status as one of the major laboratories of the Atomic Energy Commission, but which would not necessarily come under the jurisdiction of the AEC.

A major difference, at least in the early versions of the bills, is that while the Senate measure authorizes expenditures of $600 million over the next five years, the House bill would simply provide $2 million this year for the National Science Foundation to define a program and Congress would then appropriate whatever funding is deemed necessary. McCormack says, however, that the Senate bill's $600 million is "probably in the right ballpark." This year, the Administration intends to spend $50 million.

A measure of the difficulties which either bill faces, however, can be seen from the history of a more modest solar energy bill, designed to spur the production of heating and cooling units for domestic use, which at this writing is still in conference committee. When it was passed by the House early this year, five Senate committees claimed that the bill fell within their jurisdictions, and it had to be referred to each of them before being brought to the Senate floor. There's no reason to suppose that solar energy has lost its political sexiness in the meantime, and there's every reason to expect similar jurisdictional squabbles with the new bills.

Letter to the Editor

Dear Sir:

The point of view you expressed (SGR Vol. 4, No. 11) on relations between the European Science Foundation (ESF) and the European Economic Community (EEC)...is regretably misfounded in historical fact. The first reaction on a coordinated level by European science bodies (the embryonic ESF, in fact) to an EEC initiative was in 1972, not in the fall of 1973. This coming together was in response to an EEC document carrying the proposal for a science foundation limited to EEC members. However, discussion soon showed that the six countries of the then- Community did not provide a natural base corresponding to the area of Western European fundamental science cooperation already developing within the bodies promoting science and the academics. As a result of this situation, reinforced by the adhesion of new members to the Community, the Commission (of the European Communities) has taken part in the development of ESF in a positive and constructive way.

Within this relationship the EEC might well give funds to supplement those coming from individual members of the ESF, while leaving to the ESF the effective coordination of fundamental research which is in the interest of Europe and the EEC.

Michael H. Proctor
Directorate General for Research,
Science and Education,
Commission of the European Communities,
Brussels

Presidential Science Advice: The Realities

Those who wish to perceive the realities of Congress's determination to re-equip the White House with on-board science advice should recognize that the situation resembles the intrusion of a marriage counselor into an estranged relationship in which one party earnestly seeks reconciliation and the other determinedly wants out.

The essential fact of the situation is that Mr. Nixon, and probably, too, his present hand-picked entourage, do not desire a scientific presence on the premises, they perceive no need for such, and are beyond persuasion that they are in error. They base their attitude on the belief that neither this Administration nor its predecessor derived much utility from swelling the Executive Office payroll with a presidential science adviser and attending staff, and that to the extent that the President requires scientific advice, it can be obtained from the echelon to which it has been relegated, namely, the Office of the Director of the National Science Foundation.

It can be argued, of course, that they don't know what's good for them, and that Congress and the leadership of the scientific community are correct in placing high value on expert scientific and technical advice at the hub of national affairs. But even if the President could be forced to establish a staff position which he really does not want, there is no possible way to make him pay attention to the occupant of that position. So, the issue is moot as far as the Nixon Administration is concerned, since this President–assuming he is paying attention to the current agitation–is not disposed to have Congress tell him how to run his shop, or to undo a reorganization that is less than two years old.

Why, then, the Congressional fascination with the subject, and what does it portend?

The fount of agitation for reconciling science and the White House is the House Science and Astronautics Committee, which, even in the heyday of the space program, was a pygmy on the Congressional scene, the reason being that the growth of the moon project was dictated by Cold War motives and Congress merely rubberstamped what was bound to happen anyway. At times, the Committee has ranked so low in Congressional esteem that to fill its ranks it was designated as a secondary committee, to evade the rule that restricts members to only one major committee.

With the decline of the space program, the status of Science and Astronautics slumped still further, and as a consequence, the Committee has been scratching to attach itself to something important. The opportunities, however, are restricted by its limited jurisdiction, the major parts of which, beyond the space agency, are the National Science Foundation, the National Bureau of Standards, and, in a vague way, science in general. The energy fad has provided some opportunity for the Committee to enhance its importance by assigning energy R & D programs to NASA and NSF. But as things now stand in the Congressional patchwork, atomic power and coal–the giants of energy–are outside the Committee's range.

"Science," however, is not, and since a committee's influence is, by and large, related to the size and importance of the Executive functions over which it has jurisdiction, the House Science and Astronautics Committee naturally wants science to be regarded as so important that its principal representative in government will be assigned directly to the President's own personal staff. The elders of science prefer it that way, too, for reasons of their own perceptions of the importance of science in national affairs. And so a natural affinity exists between a Committee hankering for power and importance and the scientists whom Mr. Nixon ousted from their White House perch.

As noted in the last issue of SGR, however, the target of this discourse is Vice President Ford and all other presidential possibilities. No change can be expected under Mr. Nixon, but if the chorus in behalf of restoring science to the White House becomes sufficiently large and loud, it is not unreasonable to assume that the next President will conclude, Well, why not?

NASA Energy Bibliography

NASA's Scientific and Technical Information Office has published what is described as a "comprehensive energy bibliography," numbering 535 pages and containing over 1700 references from 1968-73. In addition, the Office plans a continuing bibliography that will be published quarterly.

The special bibliography and the continuing bibliography may be ordered from the National Technical Information Service, Springfield, Va., 22151. The price of the bibliography is $6.00. Quarterly supplements will cost $4.00 per individual issue or $15 a year for four supplements.

Three Top NSF Officials Take Academic Jobs

The recent resignation of three senior officials of the National Science Foundation is apparently linked to nothing more than coincidental jumps to attractive job opportunities. But these being the twilight days of a sullied Administration, there is little confidence at NSF that the posts – two requiring presidential appointment – will be promptly filled.

In order of rank, the topmost resignation is that of Raymond L. Bisplinghoff, who, after four years as No. 2 man at the Foundation, has accepted the chancellorship of the University of Missouri-Rolla. An aeronautical engineer who joined the MIT faculty in 1946, Bisplinghoff held high-level posts with NASA from 1962-65, and was dean of the MIT School of Engineering when President Nixon appointed him deputy director of NSF in 1970. No replacement appears in the wings, nor has an acting appointment been announced.

The other departing presidential appointee is Assistant Director Thomas B. Owens, a retired Navy admiral, who has headed NSF's National and International Programs since 1970. He has accepted appointement as director of graduate affairs at The American University, and his deputy, Thomas O. Jones, has been designated to fill in on an acting basis.

Finally, Thomas Jenkins, assistant director for administration, has resigned to become assistant vice president for academic planning and resource management of the statewide University of California system. The post he held, which is filled by the NSF director, has since been split into an Office of Planning and Resources Management, to which Jack T. Anderson has been appointed acting director, and a Directorate of Administrative Operations, to which Eldon D. Taylor has been appointed acting assistant director, which in the semantic garble of NSF titles, is superior to being director of a mere office, since there are many directors of NSF offices, but few assistant directors of NSF.

The three departures, then, appear to have nothing to do with mainstream political affairs in Washington or dissatisfaction with the scope and direction of NSF.

Funds Approved for Postdocs

Congress has finally acted to remedy one of the chief complaints of the biomedical research community by passing a bill to establish a new research training program for postdoctoral scientists, funded through NIH. But, since the cost of the program is more than double the amount the Administration wants to spend, and since OMB Director Roy L. Ash has recently suggested that Nixon may veto the HEW appropriations bill when it eventually emerges from Congress, the battle is far from over.

The new training program which was finally passed by Congress last month will set up a scheme to provide grants for biomedical scientists for up to three years in areas where there is a demonstrated shortage of personnel. The awards will be tied to payback provisions entailing periods of teaching or research after the grant expires.

Another part of the bill directs the Secretary of HEW to contract with the National Academy of Sciences to undertake a survey to determine where research personnel is in short supply, the results of which will be submitted to Congress each year.

Early last year, HEW Secretary Caspar Weinberger announced that NIH would be phasing out its fellowship and training programs because there is no longer a shortage of biomedical scientists. But his announcement provoked rage in the scientific community, which stood to lose a valuable source of bright young researchers, and Weinberger later announced the establishment of a new training program, to be funded at a maximum of $90 million a year. The new bill, however, authorizes expenditures of $208 million this fiscal year. At this writing, the bill is awaiting Nixon's signature.

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Fast Breeder Faces New Challenge

Among the complaints and criticisms that continue to be heaped on the Atomic Energy Commission for its unswerving commitment to the liquid metal fast breeder reactor (LMFBR), two recent developments bear close watching.

Last month, the Natural Resources Defense Council (NRDC), one of the leading opponents of the LMFBR program, charged that a dozen or so departments and agencies which should have commented on a draft environmental impact statement prepared by the AEC in March failed to do so.

Since the agencies contain "special expertise" which could have been brought to bear in assessing the statement, NRDC claimed in a letter to Russell Peterson, chairman of the White House Council on Environmental Quality (CEQ), their silence constitutes "a most serious violation of the National Environmental Policy Act" and of the CEQ's guidelines for implementing NEPA.

The importance of the charge is that it may later pop up in court as the basis of a suit accusing the AEC of failure to comply with NEPA.

It's worth noting that the only agency which did comment extensively on the draft impact statement–the Environmental Protection Agency–found the document hopelessly dificient in unbiased analysis, and gave it the lowest possible rating of inadequate. As a result, the US Court of Appeals granted AEC an extension of the deadline for producing a final environmental impact statement, and it is now expected to be published some time in the fall.

Among the agencies which failed to comment on the draft are the National Science Foundation, NASA and the Department of Interior, which should have assessed alternative technologies; the Federal Energy Administration, which has overall responsibility for energy conservation and for Project Independence, and the Departments of Defense, Transportation and Justice, which are ideally placed to discuss risks from nuclear sabotage and theft.

In a separate action, Rep. Les Aspin (D-Wisc) has asked the General Accounting Office to review AEC's cost estimates for the breeder program. Aspin has charged that the effort is being "plagued with hundreds of millions of dollars of cost overruns," and that the AEC probably puts the Pentagon to shame in its ability to rack up spectacular cost increases.

The GAO study, which will take about six months to complete, will at least partly offset a move by the Office of Management and Budget to put a gag on independent analyses of the AEC's economic arguments in favour of the breeder. Earlier this year OMB killed an attempt by EPA to let a contract for a cost-benefit analysis of the LMFBR program after EPA had advertised for bids.

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